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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,375	07/23/2003	Deepak Shukla	85507D-W	2354
7590		06/05/2007		
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			EXAMINER	
			DO, PENSEE T	
			ART UNIT	PAPER NUMBER
			1641	
			MAIL DATE	DELIVERY MODE
			06/05/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/625,375	SHUKLA ET AL.	
	Examiner	Art Unit	
	Pensee T. Do	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-27 is/are pending in the application.
- 4a) Of the above claim(s) 22-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-21 and 25-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-8, 10-27 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Amendment Entry & Claims Status***

The amendment filed on March 8, 2007 has been acknowledged and entered.

Claims 1-8, 10-21, 25-27 are being examined.

Claims 22-24 are withdrawn from further consideration.

### ***Withdrawn Rejection(s)***

Rejections under 112, 2<sup>nd</sup> paragraph in the previous office action are withdrawn herein.

Rejection under 102 (e) by Leblans is withdrawn herein.

Rejections under 103 by Leblans in view of Chee, Knowles are withdrawn herein.

### ***New Grounds of Rejection***

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8, 11-14 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Mercolino et al. (US 5,369,036).

Mercolino teaches a color coded particle comprising a reversible photochromic compound in a polymeric matrix (see col. 3, line 65-col. 4, line 4), the bead having a receptor molecule on its surface (see col. 1, lines 52-55; col. 3, lines 15-27), the photochromic compound confers on the bead a distinct optical signature; and wherein

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the receptor is able to bind to a target analyte. (see col. 3, lines 45-47). Regarding the limitation wherein the color coded bead is for use in a 2-dimensional microarray for detecting target analytes, since the color particle of Mercolino is the same as that of the present invention, such particle would be usable in a 2-dimensional microarray for detecting analytes. Regarding claim 3, it is inherent that the bead of Mercolino produces a distinct optical signature by actinic radiation since Mercolino teaches the particle as that of the present invention. Regarding claim 3, the ligand/receptor in Mercolino is biological or chemical. Regarding claims 4 and 5, Mercolino teaches the bead comprises a mixture of different photochromic/dyes compounds comprising non-photochromic compound such as organometallic. (see col. 4, lines 55-57; col. 6, lines 15-18). Regarding claim 6, Mercolino teaches that the distinct optical signature is produced by controlling a ratio of at least two photochromic compounds. (see example 3). Regarding claim 7, Mercolino teaches the distinct optical signature relates to the receptor molecule on the surface of the particle. Regarding claim 8, the polymeric matrix is organic or inorganic. (see col. 3, lines 15-20). Regarding claim 11, Mercolino teaches that the support can be polymers such as nylon, latex or glass particles. (see col. 3, lines 16-17). Nylon particles are made up of polystyrene or polymethylmethacrylate. Regarding claim 12, the optical signal is fluorescence (see col. 4, lines 51-53). Regarding claims 13 and 14, the bead have a mean diameter from about 0.01 um to about 10 um which falls on the diameter range claimed. Regarding claim 25, the dye is triphenylmethane. (see col. 4, lines 20-42).

***Claim Rejections - 35 USC § 103***

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10, 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mercolino in view of Leblans (US PGPub No. 2004/0069857).

Mercolino has been discussed above.

However, Mercolino fails to teach that the polymer matrix is an amorphous polymer. Mercolino also fails to teach a microarray comprising a 2-dimensional support, on which are disposed the beads comprising of a reversible photochromic compound in a polymeric matrix, the bead having a receptor on its surface.

Regarding claim 10, Leblans teaches that the materials which can be used for deposition of codes or photochromic compounds can be amorphous materials (see [50]) which encompass amorphous polymer. With respect to claim 15, Leblans teaches that the microcarriers are arranged in a microarray for high throughput screening assay. (see [087]). Regarding claims 17 and 18, Leblans teaches that the microcarriers are attached to the support of the array via chemical and/or biological interactions. (see [0024]). Regarding claim 16, since the microarray of Leblans are oriented in a certain way, it is inherent that the microcarriers can be randomly or in orderly distributed on the solid support. The solid support is made of microwells. (see [125]). It is conventional that microwells are made up of a polymer.

It would have been obvious to one of ordinary skills in the art to dispose the particles of Mercolino on the microarray taught by Leblans for use in high throughput screening assay. One of ordinary skills in the art would have reasonable expectation of success in combining these references because both Mercolino and Leblans teaches polystyrene beads coded with photochromic compounds having a receptor on the surface of the beads. With regards to claim 10, it would have been obvious to one of ordinary skills in the art to disperse the reversible photochromic dye as taught by Mercolino in an amorphous polymer as taught by Leblans with the advantage that different kinds of polymeric particles can be used to load with dyes such as reversible photochromic compounds as taught by Mercolino.

Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mercolino in view of Leblans as applied to claim 1 above, and further in view of Chee (US 6,429,027).

Mercolino and Leblans have been discussed above.

However, they fail to teach the laydown of microspheres on the support is 100 to a million per squared cm or 10,000 to 1000,000 per squared cm.

Chee teaches a two-dimensional array of microspheres randomly immobilized in wells of a substrate (see figs. 1A, 1B and col. 5, line 2), wherein the concentration of the microspheres can range from a single microsphere to 2 billion microspheres per  $\text{cm}^2$ . (see col. 6, lines 1-33). The microspheres bear biological probes in the form of a bioactive agent (i.e. nucleic acid, (see claim 12)) that binds an analyte of interest. The microspheres comprise a dye in the form of chromophores that can be developed to

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produce a unique optical signature that allows one to visually identify the microspheres and the bioactive agent bound to the microspheres (see claim 5, col. 21, line 25).

Chromophores as defined by Chee absorb light and convert the absorbed light into heat, which is a photo initiated process (see col. 2, lines 8-10).

Since Chee uses wells as substrate for the bead array and Leblans in combination with Mercolino also use wells as a microarray support for microspheres comprising reversible photochromic dyes, it would have been obvious to one of ordinary skills in the art coat the wells of the array in Leblans with 1 single microsphere, coded with reversible photochromic dyes as those taught by Mercolino, to 2 billion microspheres per squared cm as taught by Chee. Furthermore, it would have been obvious to one of ordinary skills in the art to coat microcarriers on wells at such ranges since it has been held that where the general conditions of a claim are disclosed in the prior arts, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mercolino in view of Luthern et al. (US PGPub NO. 2003/0030040).

Mercolino has been discussed above.

However, Mercolino fails to teach adding a light stabilizer such as a plasticizer or a hindered amine, a hindered phenol, or an excited state quencher.

Luthern teaches encapsulating reversible photochromic dyes in polymers. Light stabilizers such as plasticizers, hindered amine, hindered phenol or excited state

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quenchers can be added to increase the degree of saturation of the color change or for increasing the photochromic lifetime. (see [0017]).

It would have been obvious to one of ordinary skills in the art to add light stabilizers as taught by Luthern in the composition of Mercolino for increasing the photochromic lifetime or for increasing the degree of saturation of color change. One of ordinary skills in the art would have reasonable expectation of success in combining the two references because both teach encapsulating photochromic dyes into polymers for creating photochromic coloring pattern.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-8, 10-21, 25-27 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of



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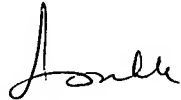
the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pensee T. Do whose telephone number is 571-272-0819. The examiner can normally be reached on Monday-Friday, 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Pensee T. Do  
Patent Examiner  
May 21, 2007

  
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